

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

ORDER NO. 90-053  
NPDES NO. CA0004880

WASTE DISCHARGE REQUIREMENTS FOR:

PACIFIC GAS AND ELECTRIC COMPANY  
PITTSBURG POWER PLANT  
PITTSBURG, CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereafter Board) finds that:

General Findings

1. Pacific Gas and Electric Company, Pittsburg Power Plant, (hereinafter, discharger) submitted a Report of Waste Discharge, dated 29 April 1988, to discharge waste under the National Pollutant Discharge Elimination System (NPDES).
2. The discharger presently discharges wastewater from the Pittsburg steam generating electric power plant into Suisun Bay, a water of the United States (Latitude 38°02'30" Longitude 121°53'50"). The discharger also discharges from the Contra Costa Power plant five miles east. This discharge is regulated under a similar but separate Order (NPDES No. CA0004863) issued by the Central Valley Water Quality Control Board.
3. The report of waste discharge and additional information describes the existing discharges as follows:

<u>Discharge Outfall</u>	<u>Contributory Waste Stream</u>	<u>Annual Average Flow (gpd)</u>
001	Once through cooling water from Units 1 through 6	1.04 billion
001A	Intake screen wash	150,000
001B	Clarifier and Filter Blowdown	120,000
001C	Reverse Osmosis Reject	280,000
001D	Boiler Blowdown	24,000
001E	Demineralization Units 1-6 Neutralization Pond Effluent	26,000

<u>Discharge Outfall</u>	<u>Contributory Waste Stream</u>	<u>Annual Average Flow (gpd)</u>
001F	Settling Pond Effluent from Fireside/Air Preheater Washes (Boilers 1-7)	2,700
001G	Oil-Water Separator Effluent from yard and building storm runoff	60,000
001H	Cooling Tower Blowdown Unit Unit 7	17,300,000
001I	Chemical Metal Cleaning Waste Pond Effluent (Boilers 1-7)	2,700
002	Stormwater from yard drains during peak storm flows	5,000
003	Stormwater from yard drains from Fuel Oil Tanks 8-14 during peak storm flows	no estimate
004	Stormwater from yard drains from Fuel Oil Tank 16 during peak storm flows	5,000
005	Stormwater from yard drains from the vicinity of the cooling water intake	no estimate
006	Stormwater from yard drains from the vicinity of the oil water separator	no estimate
007	Stormwater from yard drains from the area southwest of the warehouse	no estimate
008	Stormwater from yard drains from the area west of the warehouse	no estimate
009	Stormwater from switchyard #6	no estimate

The 001 discharge structure is located on the Southern shore of Suisun Bay approximately twelve hundred feet westerly of New York Point.

4. The discharger pumps condenser cooling water from two shoreline intakes structures located along the south shore of Suisun Bay approximately two thousand feet westerly of New York Point. Cooling water drawn from both intakes passes through separate bar racks and screens. The design approach and through-screen velocities are as follows:

	<u>Intake Serving Units</u>	
<u>Velocities</u>	1-4, 7	5&6
Approach Screen ft/sec	0.8	0.8
Through Screen, ft/sec	2.0	1.5

5. The discharger cools the condensers by pumping water from the intakes through the condensers to the point of discharge. The design capacities of the condensers and the variable speed pumps are as follows:

<u>Units</u>	<u>Design Condenser Temperature Rise</u>	<u>Pumps Design Capacity (gpm each pump)</u>
1-4	15 F	49,300
5,6	18 F	80,250
7		10,100

6. The Environmental Protection Agency (EPA) and the Board have classified this discharger as a major discharger.
7. Concrete and plastic lined evaporation ponds are maintained for the disposal of boiler chemical cleaning wastes, fireside preheater washwaters, and demineralization waste. These ponds are regulated under separate Board Order No. 87-122.
8. The discharge of boiler chemical cleaning wastes from the metal cleaning waste pond complies with effluent guidelines promulgated by the EPA. In addition, the effluent contains constituents which do not have promulgated effluent guidelines. Monitoring of these additional constituents is necessary to determine if the discharge complies with Basin Plan guidelines for heavy metals.
9. The Board adopted the Water Quality Control Plan, San Francisco Bay Basin (Basin Plan) on December 1986. The State Water Resources Control Board approved it on May 1987. The provisions of this order are consistent with the objectives of the Basin Plan.

10. The Basin Plan includes an Effluent Toxicity Control Program based on guidance presented in the Technical Support Document for Water Quality Based Control of Toxics, and implements the national biomonitoring policy established by the EPA. The overall Effluent Toxicity Control Program consists of four components: 1) an effluent toxicity characterization program; 2) the development of water quality objectives for specific pollutants; 3) system modeling and wasteload allocation; and 4) the derivation of effluent limits.
11. The Board adopted guidelines for conducting the effluent toxicity characterization component of the Effluent Toxicity Control Program on August 19, 1987, and the State Board approved it on April 21, 1988. The effluent toxicity characterization program determines the magnitude and variability of toxicity in effluents. This program consists of two major components including a species sensitivity screening study and an effluent toxicity variability study.
12. The discharger has already conducted the sensitivity screening study and has already started the effluent toxicity variability study. This study is a twelve-month study and is expected to be completed by October 1990.
13. The beneficial uses of Suisun Bay, and contiguous waters are:
  - a. Recreation
  - b. Fish Migration and habitat
  - c. Habitat and resting for waterfowl and migratory birds
  - d. Industrial, agricultural, and municipal water supply
  - e. Aesthetic enjoyment
  - f. Navigation
14. Effluent limitation, and toxic and pretreatment effluent standards, established pursuant to Sections 301, 302, 303(d), 304, 307, and 316 of the Clean Water Act (CWA) and amendments thereto, are applicable to the discharge.
15. Effluent limitation guidelines for the Steam Electric Power Generating Point Source Category have been established in 40 CFR 423. Effluent limitations contained in this Order are based on these guidelines, the Basin Plan, other State plans and policies, and best professional judgement. Effluent limitations based on Best Practicable Control Technology (BPT) are equivalent to Best Conventional Pollutant Control Technology (BCT) for this discharger.
16. The action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Section 13389 of the California Water Code.

17. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements or this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
18. The Board, in a public hearing, heard and considered all comments pertaining to the discharge.
19. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA and amendments thereto, and shall take effect ten days from the date of hearing, provided EPA has no objections.
20. A glossary of terms is provided in Attachment 1 to clarify terminology and concepts used throughout this permit.

#### Findings Related to Thermal Effluent Limitations

21. Section 316(a) of the Clean Water Act (CWA) requires compliance with State water quality standards for the discharge of thermal effluent. The State Water Resources Control Board (State Board), on September 18, 1975, amended the Water Quality Control Plan for Control of Temperature in the Coastal Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan). This plan contains water quality objectives for the San Francisco Bay Estuary and requires existing dischargers to define the effect of the discharge on beneficial uses and determine the design and operating changes necessary to achieve compliance with the provisions of this plan.
22. The Board may, in accordance with Section 316(a) of the CWA and subsequent federal regulations, including 40 CFR 122, grant an exception to specific water quality objectives in the Thermal Plan. Prior to becoming effective, such exceptions and alternative less stringent requirements must be approved by the State Board. Less stringent requirements shall provide adequate protection to beneficial uses, including the protection and propagation of a balanced indigenous community of fish, shellfish, and wildlife in and on the body of water into which the discharge is made.
23. The discharger requested an exception to the Thermal Plan and submitted reports in 1976 and 1977 intended to comply with Section 316(a) of the CWA. Organisms are exposed to thermal effects when pumped through the power plant cooling water system (pumped entrainment) and when travelling through the discharge plume (plume entrainment). Plume entrainment was evaluated in the 316(a) studies while pumped entrainment was evaluated in 316(b) studies. The exception request was held in abeyance by the Board pending results of pumped entrainment studies.

24. Based on Section 316(a) and (b) study reports submitted by the discharger, the Board determined that selected effluent limitations in the Thermal Plan were more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is made. Therefore the Board granted an exception under Section 316(a) of the CWA from the following effluent limitations in the Thermal Plan:
- "A. No discharge shall cause a surface water temperature rise greater than 4 F (2.2 C) above the natural temperature of the receiving water at any time or place."
- "C. The maximum discharge temperature shall not exceed the natural receiving water temperature by more than 20 F (11 C) (Delta-T)."
- "D. The maximum temperature of thermal waste discharges shall not exceed 86 F (30 C)."
25. On May 19, 1989, at the request of the Board staff, the discharger reapplied to the Board for exceptions from the specific water quality objectives in the Thermal Plan listed above. The Board and the Department of Fish and Game have determined the need to determine the current effects of the heated water discharge on striped bass larvae and other organisms found within the area of influence of the discharge point. If the study results demonstrate an adverse impact on the targeted organisms, the Board may modify the effluent temperature limitations specified herein.

#### Findings Related to Best Technology Available (BTA) for Intake Systems

26. Section 316(b) of the Clean Water Act (CWA) requires that the location, design, construction, and capacity of cooling water intake structures reflect the BTA for minimizing adverse environmental impact.
27. The cooling water system intakes are in the nursery area for striped bass, which is the principal organism of concern. There has been a sharp decline in striped bass populations over the past ten to fifteen years; the causes of the decline are not understood. Large numbers of young bass and other fish and invertebrates are entrained into the cooling system and are subjected to mechanical and thermal stresses. Approximately 90 percent of the fish killed each year due to entrainment (annual entrainment kills of larval and juvenile striped bass, normalized to 150 millimeters), occur in approximately a 60-day period between May and August called the entrainment period. For purposes of these requirements the entrainment period is defined in the "Provisions" section of this Order.

28. On June 1986 the Board adopted Order No.86-47. In this Order, the Board agreed to the discharger's proposed means of meeting the BTA requirements for intake structures. As described in that Order, the discharger implemented a Resources Management Program, improved intake structures, and stocked hatchery bass in the Delta. BTA, for the purposes of this Order continues to include the Resources Management Program (RMP) and the Fish Replacement Program.
29. As part of its on-going resource monitoring program, the CDF&G is evaluating the survival rate of the striped bass placed into the Bay-Delta system. The discharger has contributed to the cost of these programs , at a level satisfactory to the Executive Officer, as established under separate agreement with the CDF&G.
30. The CDF&G has indicated that intake screening technologies improved significantly in recent years. Therefore, the Discharger will be required to re-evaluate intake screening technology for Contra Costa Units 1-7 and Pittsburg Units 1-6 to determine if any additional reductions in fish kills are now possible.
31. Information provided by the discharger has shown that sediment deposition occurs within the immediate vicinity of the Pittsburg and Contra Costa power plants, and may result in increased approach velocities to the intake structure bar racks. Intake water velocities are also increase by debris accumulation on bar racks and intake screens at the two plants.

IT IS HEREBY ORDERED that the discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Prohibitions:

1. The discharge of polychlorinated biphenyl compounds above the detection limit of 0.1 ug/l is prohibited.

B. Effluent Limitations

1. Discharge 001 shall not contain constituents in excess of the following limits:

a. Chlorine residual 0.0 mg/l,  
instantaneous  
maximum

b. pH 6.5 - 8.5

- c. In any representative set of samples the waste as discharged shall meet the following limit of quality:

TOXICITY: The survival of stickleback and rainbow trout in a static bioassay test shall achieve a median of 90% survival for three consecutive samples and a 90 percentile value of not less than 70% survival for 10 consecutive samples.

d. Thermal Discharge limitation

The maximum temperature of the discharge at the flood tide shall not exceed the natural receiving water temperature by more than 28 F (14.5 C). The natural receiving water temperature shall be measured at the intake structure on high flood tides.

2. Discharge 001B, 001C, 001D, 001E, and 001F shall not contain constituents in excess of the following limits:

<u>Constituents</u>	<u>Unit</u>	<u>30-Day Average</u>	<u>Maximum Daily</u>
i. Total Suspended Solids	mg/l	30	100
ii. Oil and Grease	mg/l	10	20



3. Discharge 001H, for cooling tower blowdown, shall not contain constituents in excess of the following limits:

<u>Constituents</u>	<u>Unit</u>	<u>30-day Average</u>	<u>Maximum Daily</u>
a. The 126 priority pollutants added for cooling tower maintenance except:	ug/l	No detect-able amount	No detect-able amount
b. Chromium, total	mg/l	0.2	0.2
c. Zinc, total	mg/l	1.0	1.0
d. Chlorine residual	mg/l		0.5 In-stantaneous Maximum Free Available Chlorine
e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.			

4. Discharge 001I, metal cleaning waste pond effluent, shall not contain constituents in excess of the following:

<u>Constituents</u>	<u>Units</u>	<u>30-Day Average</u>	<u>Maximum Daily</u>
Total Suspended Solids	mg/l	30.0	100.0
Oil & Grease	mg/l	10.0	20.0
Copper, Total	mg/l	1.0	1.0
Iron, Total	mg/l	1.0	1.0

5. Discharge 001G, 002, 003, 004, 005, 006, 007, 008, and 009 shall not exceed the following limits:

<u>Constituents</u>	<u>Unit</u>	<u>30-Day Average</u>	<u>Maximum Daily</u>
i. Oil and Grease	mg/l	10	20

6. The quantity of pollutants discharged from low volume waste sources shall not exceed the quantity determined by multiplying the flow of the low volume waste source times the allowable concentrations as set forth in Effluent Limitation B.2, B.3a-c, B.4, and B.5.

C. Receiving Water Limitations:

1. The discharge of waste shall not cause the following condition to exist in waters of the State at any place.
  - a. Floating, suspended or deposited macroscopic particulate matter or foam;
  - b. Bottom deposits or aquatic growths;
  - c. Alteration of turbidity or apparent color beyond present natural background levels;
  - d. Visible, floating, suspended or deposited oil or other products of petroleum origin
  - e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl or render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.
2. The discharge of waste shall not cause the following limits to be exceeded in water of the State at any place within one foot of the water surface:

a. Dissolved oxygen	7.0 mg/l
b. pH	Variation from natural ambient pH by more than 0.5 pH units
3. The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Clean Water Act and regulations adopted thereunder. If more stringent applicable water quality standards are approved pursuant to Section 303 of the Federal Clean Water Act, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.
4. The discharge (001) shall not create a zone, defined by water

temperatures of more than 1°F above natural receiving water temperature, which exceeds 25 percent of the cross-sectional area of a main river channel at any point. If the discharge is found to be in violation of the cross-sectional area at some future date, the Discharger shall be given sufficient time to file an exemption request to this limitation.

5. The discharge (001) shall not cause more than 125 acres of surface water to rise to a temperature greater than 4°F (2°C) above the natural temperature of the receiving water.

#### D. Provisions

1. Neither the discharge nor its treatment shall create a nuisance or pollution as defined in Section 13050 of the California Water Code.
2. The discharger shall comply with the attached "Standard Provisions and Reporting Requirements" (NPDES), dated December 1986, which are a part of this Order.
3. The discharger shall comply with the attached Monitoring and Reporting Program.
4. This Order expires on April 18, 1995 and the Discharger must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, not later than 180 days in advance of such date as application for issuance of new waste discharge requirements. Order Nos. 83-22, 84-15, and 86-47 are hereby rescinded.
5. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the discharger, the discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to this office.
6. The discharger shall conduct a study of the effects of the heated water discharge on the striped bass larva and other organisms within the area of influence of the discharge. The study shall be a minimum of twelve months in length and shall be conducted in accordance with the following schedule:

Submit draft study plan	Oct. 1, 1990
Submit final study plan	Nov. 15, 1990
Submit Interim Progress Report	Apr. 15, 1991
Submit Final Report	June 15, 1992

7. The discharger shall measure bar rack approach velocity and sediment deposition at each intake structure annually. The discharger shall dredge sand and silt to eliminate buildup in front of the intake structures and routinely clean the bar racks at Pittsburg Power Plant, as necessary to maintain bar rack approach velocities as close as practicable to design levels. The discharger shall rotate and clean intake screen assemblies for all screen assemblies in operation at a frequency of not less than once every four hours for the purpose of maintaining intake water velocities as close as practicable to design levels.
8. The discharger shall minimize the duration, frequency, and concentration of chlorine application as a cleaning agent for the condensers.
9. The Board is developing a region-wide surface water monitoring program to determine compliance with water quality objectives in San Francisco Bay and its tributaries. The attached self-monitoring program may be reopened during the life of this permit to require the discharger to participate in this regional monitoring program.

Provisions Related to BTA

10. During the entrainment period, the discharger shall implement the following Resources Management Program, which is designed to minimize adverse environmental impacts:
  - a. The discharger shall maximize the commitment of, dispatching of, and power production from Pittsburg Unit 7, as required to meet system demand, in place of and before the dispatching and power production above minimum load at any other unit at Pittsburg or Contra Costa Power plants, except under the following conditions:
    - 1) Pittsburg Unit 5 or 6 may operate at minimum load whenever Pittsburg Unit 7 is committed for the purpose of providing steam necessary to start or restart Pittsburg Unit 7.
    - 2) The discharger may remove Pittsburg Unit 7 from service for emergency or unscheduled maintenance, for personnel or equipment safety, or for the reliability of the system.
    - 3) The discharger may have Pittsburg Unit 7 at less than full load when other committed units are dispatched above minimum load if necessary to meet system stability, equipment safety, or personnel safety, and to respond to system transient conditions.
  - b. The discharger shall minimize the commitment and dispatch of all units at Pittsburg Power plant, except for Pittsburg Unit 7, and of all units at Contra Costa Power Plant to minimize

cooling water flows unless commitment and dispatching of these units is necessary to meet system demand, to meet California Power Pool commitments, and/or to maintain system reliability according to prudent utility operating practice including equipment and personnel safety.

- c. All committed units at Pittsburg and Contra Costa Power plants must be dispatched to the level at which the unit discharge temperatures equal 86 F before the discharge temperature for any similar unit is allowed to exceed 86 F.
- d. The discharger shall monitor fish population densities (as provided in Attachment 4) at Pittsburg and Contra Costa power plants during the entrainment season, and preferentially dispatch committed units above 86 F at the plant which has the lower fish density, provided the density difference is greater than 0.0002 normalized fish per cubic meter.
- e. The discharger shall schedule Pittsburg Unit 7 overhauls so that scheduled work will be completed before April 1 each year.
- f. The discharger shall minimize circulation water flows under all conditions, except during chlorination, while maintaining discharge temperatures pursuant to this Order. The discharger shall use the variable speed pumps whenever the units operate at reduced loads, in accordance with design parameters. Reduced load is defined as less than 95% of maximum load for the existing variable speed pumps. The discharger shall shut off circulation water for uncommitted units as soon as possible, except as required according to prudent operating practices to insure personnel and equipment safety.
- g. The discharger shall recirculate house unit cooling water to suction when the house units at Contra Costa are in service without the main units.
- h. Except for compliance with NRC requirements and refueling of Diablo Canyon Power plant, the discharger shall minimize scheduled maintenance outages at any PG&E power plant if they result in increased use of any unit at the Pittsburg and Contra Costa Power plants during the entrainment period.

11. The entrainment period shall commence:

- 1) May 1 if the discharger does not conduct a Threshold Monitoring Program (Attachment 3), or
- 2) such later date that the discharger demonstrates by a Threshold Monitoring Program (Attachment 3) that the density of entrained striped bass normalized to 150 mm equivalents at the Pittsburg or Contra Costa power plants exceeds 0.0005 per

cubic meter of cooling water for three consecutive days, or

- 3) if the entrainment abundance threshold is not reached before June 1, the entrainment season will commence June 1, unless the Executive Officer determines that not implementing an entrainment season would not materially or significantly impair striped bass survival.

Regardless of the triggering mechanism, the initial entrainment period will last for a minimum of three weeks. Monitoring samples exceeding two per week may be either Threshold Monitoring (Attachment 3) or Entrainment Abundance Monitoring (Attachment 4). The entrainment period shall terminate when:

- 1) the density of striped bass normalized to 150 mm is less than 0.0005 per cubic meter of cooling water in any three consecutive monitoring sample at both Pittsburg and Contra Costa power plants, or
- 2) the day when the striped bass 38 mm index is set, as predicted by CDF&G, whichever is earlier.

If the entrainment period is terminated for any reason described above, the Threshold Monitoring Program must be resumed and continued daily at both the Pittsburg and Contra Costa Power plants either until three days before the date CDF&G predicts that the 38 mm index will be set, or until the normalized density rises again above 0.0005 bass per cubic meter of cooling water for three consecutive days at either plant, whichever is earlier. In the latter event, the entrainment period will start again, and its termination shall be determined according to the provisions of the previous paragraph.

If CDF&G does not conduct surveys to determine the date when the 38 mm index is set, it will be assumed to be set on July 15 for purposes of implementing this section.

The discharger shall notify the Board within three days of either beginning or ending the entrainment period between May 1 and 30 July of each year.

12. The discharger shall provide a technical report to the Board on November 1 each year, which shall include an evaluation of the previous period's BTA program performance according to the methodology approved by the Executive Officer.
13. The discharger shall operate intake structures at Contra Costa and Pittsburg power plants and manage existing new power resources to reduce striped bass kills at these plants. The goal for striped bass kill reduction is 79 percent.
14. The discharger shall calculate the fish kill percent reduction

using the hindcast version of the SIMBAS computer model, the version available as of July 1988, except that the model may be revised with the written concurrence of the Executive Officer. The input to the model will be the actual operating parameters measured for the preceding period. If the discharger does not meet a percentage fish kill reduction of at least 50 percent, the Executive Officer will present a report to the Board, which may consider enforcement or other remedial actions.

The percentage kill reduction is the quantity one minus the ratio of the estimated kills in the current year (March 1 to February 28) to the average estimated kills from the three-year base period of 1976, 1978, and 1979, multiplied by 100.

The following conventions shall apply:

- (1) Striped bass numbers are expressed in 150 mm equivalents.
  - (2) Striped bass densities from the current year, as determined by the Entrainment Monitoring Program, will be used to calculate estimated kills for both the current year and for the average of the base years.
  - (3) The estimated striped bass kill for the base year period is the average of individually calculated kills for 1976, 1978, and 1979, based on actual operation in those years.
15. The discharger shall stock yearling striped bass annually pursuant to the following Fish Replacement Program depending on the percentage kill reduction achieved.

<u>Kill Reduction Percentage</u>	<u>Number of Yearling Fish</u>
79.1% - 92.5%	100,000
65.1% - 79.0%	200,000
55.1% - 65.0%	300,000
50.1% - 55.0%	400,000
45.1% - 50.0%	500,000
40.1% - 45.0%	600,000
40.0% or less	700,000

16. The discharger shall enter into an agreement with the Department of Fish and Game concerning the propagation and release of striped bass consistent with the Fish Replacement Program outlined above by July 1, 1990. The Discharger shall continue to comply with provisions of the existing agreement until the new agreement is in place.
17. The discharger will provide the Regional Boards and CDF&G with estimates of the number of striped bass eggs and larvae entrained and killed at the Pittsburg and Contra Costa Power plants. These

estimates will be stratified by:

- a. eggs,
- b. one mm size increments for larvae from 4 mm to 20 mm, and
- c. not more than 5 mm size increments for larvae greater than 20 mm.

These estimates will be provided by 1 November each year.

18. The discharger shall re-evaluate intake screening technology in coordination with the Department of fish and Game, the US Fish and Wildlife Service, and the National Marine Fisheries Service for Contra Costa Units 1-7 and Pittsburg Units 1-6 in accordance with the following schedule:

Submit Work Plan  
Begin Evaluation  
Submit Report

Dec. 1, 1990  
Apr. 1, 1991  
Jan. 1, 1992

19. The Executive Officer is directed to report to the Board by April 1993 regarding the discharger's progress in reducing striped bass kills.

I, Steven R. Ritchie, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on April 18, 1990.



Steven R. Ritchie  
Executive Officer



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

SELF MONITORING PROGRAM  
FOR

PACIFIC GAS AND ELECTRIC COMPANY  
PITTSBURG POWER PLANT  
PITTSBURG, CONTRA COSTA COUNTY

MONITORING AND REPORTING PROGRAM NO. 90-053

NPDES NO. CA0004880

CONSISTS OF

PART A, Dated DECEMBER 1986

and

Part B

PART B

DESCRIPTION OF SAMPLING STATIONS AND SCHEDULE OF SAMPLING ANALYSIS  
AND OBSERVATIONS

I. Sampling Station Location/Description

A. Influent

<u>Station</u>	<u>Description</u>
I-001	At any point in the influent stream prior to the condensers and upstream of any treatment where representative samples of the influent to Units 5 and 6 can be obtained.

B. Effluent

<u>Station</u>	<u>Description</u>
E-001	At any point in the outfall for Units 1-6 from which once-through cooling water is discharged, between the point of discharge to Suisun Bay and the point at which all pollutants tributary to that outfall are present.
E-001B thru E-001G	At any point in the pipe from which low volume waste is discharged prior to combination with once-through cooling water.
E-001-H	At a point in the cooling water blowdown stream prior to mixing with once-through cooling water.
E-001-I	At a point where metal cleaning waste pond effluent is discharged, prior to combination with once-through cooling water.
E-002	At a point at in the Outfall of combined yard drains prior to discharge to Suisun Bay.
E-003	At a point in the Outfall of combined yard drains from fuel oil tanks 8-14 prior to discharge to Willow Creek.
E-004	At a point in the Outfall from yard drains from Fuel Oil Tank 16 prior to discharge to Suisun Bay.
E-005	At a point in the Outfall from yard drains from the vicinity of the cooling water intake prior to discharge to Suisun Bay.

DESCRIPTION OF SAMPLING STATIONS AND SCHEDULE OF SAMPLING ANALYSIS  
AND OBSERVATIONS (continued)

I. Sampling Station Location/Description

B. Effluent

<u>Station</u>	<u>Description</u>
E-006	No longer exists.
E-007	At a point in the Outfall from yard drains from the area southwest of the warehouse prior to discharge to Suisun Bay.
E-008	At a point in the Outfall from yard drains from the area west of the warehouse prior to discharge to Suisun Bay.
E-009	At a point in the Outfall from the yard area west of switchyard #6 prior to discharge to Willow Creek.

II. Schedule of Sampling and Analysis

INFLUENT MONITORING

The following shall constitute the influent monitoring program:

<u>Station</u>	<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
I-001	temperature	F	-	continuous
	Tot. Sus. solids	mg/l lbs/day	Grab	monthly
	pH	-	Grab	monthly

#### EFFLUENT MONITORING

The following shall constitute the effluent monitoring program:

<u>Station</u>	<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
E-001	temperature	F	-	continuous
	flow	MGD	from pump operating data	daily
	pH	pH units	Grab	monthly
	chlorine	mg/l	Grab	daily, when treating
	96-hour fish bioassay	% survival	24 hr composite	monthly
E-001-B-F	Flow	mgd	-	monthly
	Tot. Sus. solids	mg/l	Grab*	monthly
	Oil and Grease	mg/l	Grab*	monthly
E-001-H	Flow	mgd	-	monthly
	Chromium, zinc	mg/l	Grab	weekly, when adding maintenance chemicals
	Priority Pollutants Added	mg/l	Grab	annually
E-001-I	Total Sus. solids	mg/l	Grab	daily during discharge; sampling shall be representative of the first discharge, and the end of the discharge cycle.
	Oil & Grease	mg/l	Grab	
	Copper, total	mg/l	Grab	
	Iron, total	mg/l	Grab	
	Nickel, total	mg/l	Grab	
E-002 through E-009	Oil & Grease	mg/l	Grab	weekly

\*Flow proportional composite within  $\pm 5\%$  from Stations E-001-B through E-001-F

## AMBIENT (RIVER) WATER MONITORING

Ambient river conditions will be determined at the intake structure (I-001):

<u>Constituent</u>	<u>Unit</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Temperature during	F	Grab	Twice weekly max flood tide

## BTA MONITORING

- A. The following data shall be collected and used in estimating the percentage reduction in striped bass kills and the data shall be available to the Regional Board upon the request of the Executive Officer:
1. Each unit's hourly cooling water flow for each day of the entrainment period.
  2. Hourly temperature measurements in the discharges of Pittsburg Units 1-4, Pittsburg Unit 5, Pittsburg Unit 6, Contra Costa Units 1-5, Contra Costa Unit 6, and Contra Costa Unit 7 for each day of the entrainment period.
  3. Hourly records of gross electrical generation (MW) for each unit at the Contra Costa and Pittsburg Power Plants (excluding house units) during the previous entrainment period.
- B. On November 1 of each year, the Discharger shall submit a postentrainment period report which shall include, but not necessarily limited to the following:
1. An estimate, based on the Hindcast version of the SIMBAS computer model, of percentage reduction in striped bass kills during the preceding period starting May 1 and ending when the 38 mm index is set, based on actual cooling system operation at the Pittsburg and Contra Costa Power Plants.
  2. A comparison of the percentage reduction in striped bass kills estimated based on actual cooling water system operation with kill reduction goals.
  3. A tabulation of outages and curtailments for Pittsburg Unit 7 by occurrence with a brief description of the cause of each occurrence during the previous entrainment period.
  4. A comparison of hourly electrical generation by unit at Contra Costa Units 1-7 and Pittsburg Units 1-6 with the generation

at Pittsburg Unit 7 (expressed as a percentage of available capacity) during the previous entrainment period as it pertains to compliance with provisions of the Resources Management Program.

5. A summary of information used to determine the start and end date of the entrainment period.
6. A discussion of the correlation between Delta flowrates and spatial distribution of striped bass prior to the entrainment season as it pertains to the Threshold Monitoring Program.
7. A summary of monthly capacity factors and generation by unit for the Pittsburg and Contra Costa Power Plants and monthly cooling water flow by unit group as in A.2 for the preceding entrainment period.
8. An annual BTA compliance summary addressing:
  - a. Compliance with Resources Management Program.
  - b. Status of intake system improvements and modifications, if any.
  - c. Intake velocity and bathymetry information and a summary of intake maintenance during the preceding entrainment period.
  - d. A summary of projected unit outages for overhaul scheduled for the subsequent calendar year and a summary of actual outages for unit overhaul during the previous calendar year.
  - e. A summary of intake screen operation (rotation frequency) at Contra Costa and Pittsburg Power Plants, and fish pump operation at the Contra Costa Units 1-5 intake during the preceding entrainment period.
  - f. Status of the Fish Replacement Program for the previous striped bass year.
- D. At the discretion of the Discharger, a Threshold Monitoring Program may be conducted as described in Attachment 3 which is made a part of this Order.
- E. An Entrainment Monitoring Program shall be conducted each year as described in Attachment 4 and is made part of this Order.

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedures set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with Waste Discharge Requirements established in this Order.
2. Is effective on the date shown below.
3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the Discharger, and revisions will be ordered by the Executive Officer.

  
Executive Officer

4/18/90  
Effective Date

## ATTACHMENT 1

### GLOSSARY OF TERMS

#### 1. Thermal Plant Unit Commitment

This is the procedure used to determine which of PGandE's units will be operated, generally based upon the following criteria:

- a. estimated hourly and daily peak demands for the next several days;
- b. availability of other lower cost power, including hydroelectric, nuclear, geothermal, purchased power, and co-generation;
- c. spinning reserve requirement;
- d. availability of thermal electric units (whether units are out of service for maintenance or repairs);
- e. regional load requirements (e.g., minimum load requirement at certain plants to prevent transmission overloading); and
- f. relative thermal efficiency of units.

After evaluating these criteria, the system dispatcher will select the units to be placed in service with sufficient lead time since thermal units may require eight hours to place into service.

#### 2. Spinning Reserve

When a unit is operating at less than full load and ready to increase its load to make up for a sudden power loss elsewhere in the system, the difference between actual and full load is the amount of spinning reserve. The California Power Pool requires that each member utility, including PGandE, maintain a spinning reserve equal to 7% of its estimated daily peak load.

#### 3. Economic Dispatch

Once the committed units are in operation, the next step is to determine the proper loading of each unit. The PGandE dispatch computer reviews the actual load requirements every four seconds and then determines the most economical loading for each thermal unit to meet the demand and minimize the fuel burned. The actual loading on each thermal unit is a function of its thermal efficiency fuel cost, location in the PGandE system, and of the total demand.

#### 4. Unit Service

During the course of a day, many of the PGandE generating units



serve as base, peaking and load following units. Gas and oil fired steam electric units normally are not shut down overnight and, therefore, provide a minimum output during the early morning hours which may be considered as base load. The units then follow load during the morning and afternoon load changes and provide peaking capability over the peak hours.

a. Base Load Unit

A unit normally operated at or near its maximum on a continuous basis and usually not capable of rapid response to load change, such as geothermal units.

b. Peaking Unit

A unit normally capable of a fast start and loading and used only over the peak load hours of the day or during emergencies, such as combustion turbines.

c. Load Following Unit

A unit designed to change load with changes in the system load demands, such as gas and oil fired steam electric units and most hydroelectric units.

5. Entrainment Period

The period during spring and early summer when larval and early juvenile striped bass are susceptible to entrainment (see Provision E.10.d).

6. Entrainment

The capture of small organisms in water which is drawn through the intake screens and into the cooling water system of a power plant.

7. Impingement

The capture of organisms retained on the intake screens of a cooling water system.

8. Recruitment

The number of fish reaching sexual maturity or fishable (legal) size.

9. Young-of-the-Year

Fish in their first year of life.

10. Ristroph Modified Screens

Ristroph modified screens, are aimed at reducing the mortality of impinged organisms through the following features:

- a. Watertight fish collection buckets along the base of each screen panel to prevent repeated impingement of organisms and to provide a holding area for organisms during screen rotation,

- b. A low-pressure wash system to remove impinged organisms from the screen, reducing the stress and abrasion that results from exposure to the high pressure spraywash required for the removal of debris,
- c. A fish return system to transport organisms removed from the screen by the low-pressure spraywash back to the receiving water body, and
- d. Heavy-duty bearings and motors to permit continuous rotation and cleaning, minimizing the time an organism is retained on the screen.

11. Variable Speed Circulating Water Pump Controls

Variable frequency controls installed on the circulating water pumps enabling cooling water flow through the condensers to be reduced by lowering the pump speed.

ATTACHMENT 2

(THIS PAGE IS A SPACE HOLDER BECAUSE  
ATTACHMENT 2 IS NO LONGER USED)

### ATTACHMENT 3

#### PITTSBURG AND CONTRA COSTA POWER PLANTS STRIPED BASS THRESHOLD MONITORING PROGRAM

At its discretion, the discharger may choose to conduct a Threshold Monitoring Program to determine the starting date for the entrainment period. If the Threshold Monitoring Program is conducted, it will be conducted as follows:

1. If the mean Delta outflow, as determined by the Department of Water Resources daily operations data, averages less than 20,000 cfs from April 7 through April 23, the Program shall be conducted at the Contra Costa Power Plant from 28 April until 1 June, or until the entrainment period begins, whichever is earlier.
2. If the Delta outflow specified in paragraph 1 exceeds 20,000 cfs, the Program shall be conducted at the Pittsburg Power Plant from 28 April through 1 June, or until the entrainment period begins, whichever is earlier. In all years, the Program shall be conducted at both the Pittsburg and Contra Costa Power Plants after 1 June if the entrainment period has not yet started.
3. Sampling will be conducted daily for a three hour period (approximately 2000 to 2300 hours). Other than the sampling period, the sampling and analysis protocol will be the same as described for Entrainment Abundance Monitoring in Attachment 4.
4. The Threshold Monitoring Program may be terminated during the entrainment period(s) at the Discharger's discretion. Threshold Monitoring will terminate when the 38 mm index is predicted to be set by CDF&G.

#### ATTACHMENT 4

### PITTSBURG AND CONTRA COSTA POWER PLANTS STRIPED BASS ENTRAINMENT MONITORING PROGRAM

#### Entrainment Abundance Monitoring

The entrainment abundance monitoring program has been designed to provide information on the size-specific density and seasonal distribution of larval and juvenile striped bass entrained at the Pittsburg and Contra Costa power plants. The entrainment monitoring shall begin the first week of May and continue through 15 July of each year, or the end of the entrainment period, whichever is later. Routine entrainment sampling will be conducted during a 12-hour period (approximately 1500 to 0300 hours) once per week until the entrainment period start date has been determined, at which time the sampling frequency will be increased to two sampling periods per week at each plant. The twice weekly sampling will continue until the entrainment period has ended. The entrainment sampling frequency will then be reduced to once per week at each plant and continue until 15 July or the date CDF&G predicts that the 38 mm index will be set, whichever is later. Sampling equipment and processing methods will be standardized between the two power plants.

The plankton nets will be cycled periodically throughout the 12-hour collection period, and the sample removed from the collection net using standard rinsing procedures. Samples will be labeled, stained with rose bengal, and preserved. Samples will be sorted using a magnifying illuminator or dissecting microscope to remove fish larvae. Striped bass larvae will be identified, counted, and the total length measured. Fragments of striped bass constituting less than 50 percent of total body length will be recorded as observations, but will not be included in the estimation of size-specific densities. Following identification and measurement, fish larvae will be placed in labeled vials and archived.

Archived samples will be discarded after completion of each year's monitoring program".

Entrainment monitoring results will be summarized as the size-specific density (no./cubic meter) of striped bass collected on each sampling date at the two power plants.